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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,300	09/01/2004	Akihito Saitoh	03500.017132	8354
5514	7590	10/17/2006	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			CROUSE, BRETT ALAN	
			ART UNIT	PAPER NUMBER
			1774	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/506,300

Applicant(s)

SAITOH ET AL.

Examiner

Brett A. Crouse

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :09/01/2004; 01/25/2005; 05/17/2005.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 8 and 11 are rendered indefinite by the phrase “---any of which has a connecting group comprising a substituted or unsubstituted arylene group or a ---” because it is unclear as to whether a “connecting group” is optional or required.

Claims 9, 10, and 12-16 are rendered indefinite because they inherit the limitations of the claims from which they depend.

Claim 13 recites the limitation “the oligofluorenylene” in line 4. There is insufficient antecedent basis for this limitation in the claim. The examiner suggests the phrase “the trifluorenylene” as an alternative.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

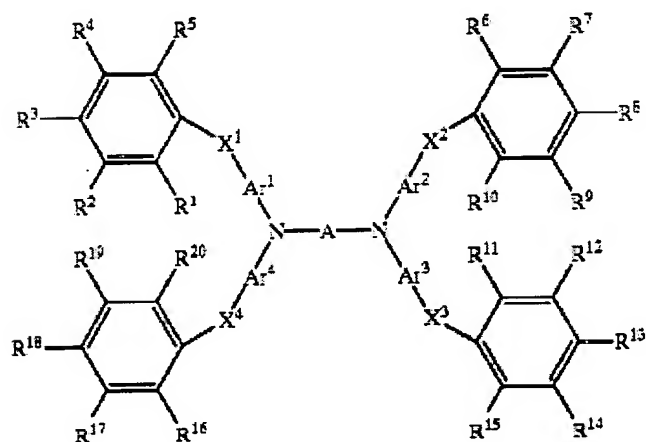
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Claims 8-16 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,280,859 to Onikubo, et.al., hereafter known as (Onikubo '859).

As to claims 8, 9, 10, 11, and 12 (Onikubo '859) teaches in column 2, lines 11-49:

" According to the present invention, there is provided a light-emitting material of the formula [1] for an organic EL device,

[1]



wherein A is a substituted or non-substituted aromatic group, a substituted or non-substituted fused aromatic group (excluding a group of the formula [2] shown below), a substituted or non-substituted hetero-aromatic group, a substituted or non-substituted fused hetero-aromatic group or a divalent group (excluding a group of the formula [3] shown below) in which 2 to 10 identical or different groups out of

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the above groups are bonded to each other directly or through at least one of an oxygen atom, a nitrogen atom, a sulfur atom, a linear structural unit having 1 to 20 carbon atoms and optionally containing a hetero-atom, or a non-aromatic ring structural unit, each of Ar.<sup>1</sup> to Ar.<sup>4</sup> is independently a substituted or non-substituted aromatic group or a substituted or non-substituted fused aromatic group, each of X.<sup>1</sup> to X.<sup>4</sup> is independently --O--, --S--, >C.dbd.O, >SO.sub.2, --(C.sub.x H.sub.2x)--O--(C.sub.y H.sub.2y)-- (in which each of x and y is an integer of 0 to 20, while x+y=0 in no case), a substituted or non-substituted alkylidene group having 2 to 20 carbon atoms, a substituted or non-substituted alkylene group having 2 to 20 carbon atoms or a substituted or non-substituted divalent alicyclic residue, and each of R.<sup>1</sup> to R.<sup>20</sup> is independently a hydrogen atom, a halogen atom, a substituted or non-substituted alkyl group, a substituted or non-substituted alkoxy group, a substituted or non-substituted aromatic group, a substituted or non-substituted hetero-aromatic group or a substituted or non-substituted amino group (provided that adjacent groups of R.<sup>1</sup> to R.<sup>5</sup>, R.<sup>6</sup> to R.<sup>10</sup>, R.<sup>11</sup> to R.<sup>15</sup>, or R.<sup>16</sup> to R.<sup>20</sup> may bond to each other to form a fresh ring)"

(Onikubo '859) additionally provides in column 4, line 50 through column 6, line 13 specific examples of A from formula 1 above. Within this disclosure on column 4, line 67 (Onikubo '859)

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discloses that fluorene is included in the "substituted or non-substituted divalent aromatic or fused aromatic group residues" of specific examples of A. Additionally, see compound A-12 in column 7. As taught in column 2, 2 to 10 of these groups can be bonded directly.

As to claims 13, 14, 15, and 16 the teachings of (Onikubo '859) as in the previous rejections are relied upon. Additionally, (Onikubo '859) teaches in column 4, lines 37-45 with regard to the material of formula 1:

"Further, according to the present invention, there is provided an organic EL device comprising a light-emitting layer or a plurality of organic compound layers including the light-emitting layer and a pair of electrodes, the light-emitting layer or a plurality of the organic compound layers being sandwiched between a pair of the electrodes, wherein the light-emitting layer contains the above light-emitting material."

Thus (Onikubo '859) reasonably discloses all the limitations of the rejected claims.

Claims 8, 10, 11, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by (JP 2001-039933, Nakatsuka et.al.) hereafter known as Nakatsuka.

As to claims 8, and 10 Nakatsuka teaches in paragraphs [0007] – [0021], formula 1, and for example structures F-37 through F-48 compounds conforming to the limitations of claims 8, 10, and 11. With respect to claim 10, the examiner notes that "the other substituent" is not present when both substituents on each nitrogen atom are phenyl groups.

As to claims 13 and 15 the teachings of Nakatsuka as in the previous rejections are relied upon. Additionally, Nakatsuka teaches in paragraphs [0113] - [0115] an electroluminescence device having compounds of formula 1 within a layer between a cathode and anode.

Thus Nakatsuka reasonably discloses all the limitations of the rejected claims.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

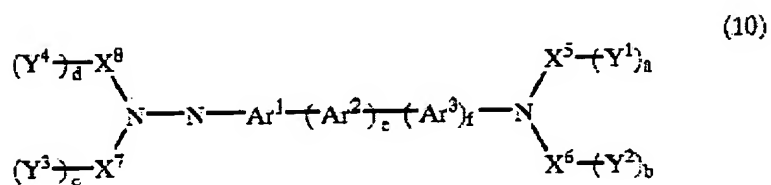
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 8-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0072966 to Hosokawa, et al., hereafter known as (Hosokawa '966).

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As to claims 8, 9, 10, 11, and 12 (Hosokawa '966) teaches on page 3 paragraphs [0036] – [0037]:

“[0036] General formula [10]



[0037] wherein Ar.sup.1 and Ar.sup.3 each independently represents a divalent group selected from a group consisting of substituted and unsubstituted phenylene groups, substituted and unsubstituted 1,3-naphthalene groups, substituted and unsubstituted 1,8-naphthalene groups, substituted and unsubstituted fluorene groups and substituted and unsubstituted biphenyl groups, Ar.sup.2 represents a divalent group selected from a group consisting of substituted and unsubstituted anthracene nuclei, substituted and unsubstituted pyrene nuclei, substituted and unsubstituted phenanthrene nuclei, substituted and unsubstituted chrysene nuclei, substituted and unsubstituted pentacene nuclei, substituted and unsubstituted naphthacene nuclei and substituted and unsubstituted fluorene nuclei, X.sup.5 to X.sup.8 each independently represent a substituted or unsubstituted arylene group having 6 to 20 carbon atoms, X.sup.5 and X.sup.6 may be bonded to each

other,  $X^{\text{sup.7}}$  and  $X^{\text{sup.8}}$  may be bonded to each other,  $Y^{\text{sup.1}}$  to  $Y^{\text{sup.4}}$  each independently represent an organic group represented by general formula [2] described above, a to d each represent an integer of 0 to 2,  $a+b+c+d \leq 2$ , e represents 0 or 1, f represents 1 or 2 and, when  $Ar^{\text{sup.2}}$  represents an anthracene nucleus, a case in which  $a=b=c=d$  and  $Ar^{\text{sup.1}}$  and  $Ar^{\text{sup.3}}$  both represent p-phenylene group is excluded." Hosokawa does not provide an explicit example of multiple fluorene as  $Ar^1$ ,  $Ar^2$ , and  $Ar^3$ . It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to make and use a compound of Hosokawa where  $Ar^1$ ,  $Ar^2$ , and  $Ar^3$  are fluorene and having substituted or unsubstituted phenyls for  $X^1$ ,  $X^2$ ,  $X^3$ ,  $X^4$ ,  $X^5$ ,  $X^6$ ,  $X^7$ , and  $X^8$  similar for example, to structures 20, 21, and 135 of Hosokawa to produce a electroluminescent compound, as one of ordinary skill in the art would have reasonably expected similar chemical structures to exhibit similar properties.

Further as to claims 13, 14, 15, and 16 (Hosokawa '966) teaches on pages 43-44, paragraphs [0116]-[0121] and on pages 77-78, examples 63 through 66 the fabrication of electroluminescent devices having electroluminescent materials between anode and cathode. It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use a compound of Hosokawa where  $Ar^1$ ,  $Ar^2$ , and  $Ar^3$  are fluorene and having substituted or unsubstituted phenyls for  $X^1$ ,  $X^2$ ,  $X^3$ ,  $X^4$ ,  $X^5$ ,  $X^6$ ,  $X^7$ , and  $X^8$  as for example in structures 20, 21, and 135 of Hosokawa for use in an electroluminescence device as a light emitting layer, hole transport layer, electron transport layer, or as a dopant as suggested by Hosokawa in paragraphs [0100] – [0101].

Claims 8-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,280,859 to Onikubo, et al., hereafter known as (Onikubo '859) as applied to claims 8-16 above.

The teachings of (Onikubo, '859) as in the previous rejections are relied upon. It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use a compound of (Onikubo, '859) as the light emitting layer of an electroluminescence device because a compound of formula (1) can have fluorene as the A substituent and possess from 2 to 20 groups bonded to each other as A. Further, (Onikubo '859) suggests the use of compounds of formula (1) in a light emitting layer of an electroluminescence device. One of ordinary skill in the art at the time of invention by applicant would reasonably expect similar chemical structures meeting the limitations of formula (1) to exhibit similar properties to those explicitly taught by (Onikubo '859) as desirable for use in electroluminescence devices.

Claims 8-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over (JP 2001-039933, Nakatsuka et al.) hereafter known as Nakatsuka as applied to claims 8, 10, 11, 13, and 15 above. The teachings of Nakatsuka as in the previous rejections are relied upon. As to claims 8, 9 and 10, it would have been obvious to one of ordinary skill in the art at the time of invention by applicant to make compounds based on the teachings of Nakasuka having three fluorene rings bonded together and substituted phenyls, polycyclic rings, or heterocyclic rings bonded to each nitrogen by combining the teachings of formula (1) and example compounds F-37 through F-47. As to claims 11,12,13, and 15, Nakasuka does not provide an explicit example of a compound having four or more fluorene groups bonded together. It would have been obvious to

one of ordinary skill in the art at the time of invention by applicant to make compounds having four or more fluorene groups bonded together and to use said compounds in an electroluminescence device because Nakasuka teaches in compounds F-31 through F-36 compounds having four aromatic or heteroaromatic groups bonded together, including fluorene, which conform to formula 1 and the use of the compounds of formula 1 in an electroluminescence device within a layer between a cathode and an anode.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references relate either to the field of the invention or subject matter of the invention, but, are not relied upon in the rejections of record:

US 6,362,310; US 6,777,531; US 6,916,555.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brett A. Crouse whose telephone number is 571-272-6494. The examiner can normally be reached on Monday - Friday 6:00AM - 2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BC 11 October 2006



MARIE YAMNITZKY  
PRIMARY EXAMINER

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10/12/2006